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What to do for a Literature Review? – A Synthesis of Literature Review Practices

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What to do for a Literature Review? – A Synthesis of Literature Review Practices

Completed Research

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Abstract

Literature reviews are an essential part of science, helping to gain a deeper understanding of a research topic, related theories, commonly applied methods, and potential research gaps. Conducting a literature review can follow various approaches, ranging from detailed methods to general guidelines, each emphasizing different parts of the literature review process. However, identifying which method or guideline to follow can be complicated and confusing because of the “jungle” of options. To address this challenge, this study applies a literature review approach on literature review studies and combines it with a method engineering process to develop a composite literature review method. The developed composite method provides an overview of the various tasks, decisions, available analysis methods, and challenges within a literature review process and also options to address them. Overall, the developed method constitutes the first step towards a summary of literature review practices, providing guidelines, examples, and best practices.

Keywords

Literature Review, Literature Search, Synthesis, IS Research, Flowchart, Guidelines

Introduction

Literature reviews are an essential part of research (Webster and Watson, 2002), grounding investigation in the related knowledge bases (vom Brocke et al., 2009), providing ground for the discovery of knowledge gaps (Müller-Bloch and Kranz, 2015), and preventing researchers from re-answering already answered questions (vom Brocke et al., 2009). These overviews can be generated either as an independent study or as part of the motivation/research background of a scientific article. Given the increase in the number of publications in any research field, and the consequent increase in the time and effort required to undertake a wholesome review of a field’s status-quo, systematic and structured literature reviews have become valuable sustenance in current literature production (Rowe, 2014).

Various Literature Review Methods (LRM) have been developed to structure literature reviews projects. Applying an established method ensures high quality, rigor, transparency, relevance, and reproducibility (vom Brocke et al., 2009). However, this availability of a plethora of LRM brings up a new problem – that of choice. LRM provides a frame of what steps to take (e.g., the conceptualization of topic, search literature, analyze literature) and also some prescription of how to carry out each of them. The appropriateness, utility, and strength of review methods are difficult to predict during its conception and will only become evident during application. Hence, we argue that the search for a LRM often ends at the point of personal

preference. This can lead to conflicting understandings of the conduction of literature reviews and fuzzy results (Rowe, 2014; Sebastian K. Boell and Cecez-Kecmanovic, 2014), especially when various methods are added and combined. Therefore, to provide an overview of how literature reviews are conducted and to provide a summary of how literature reviews can/should be conducted, this study aims to answer the following research questions:

RQ1: What is the current status quo of literature review methods and their application in IS research?

RQ2: How can current literature reviews be consolidated as a composite method?

Research Background

A literature review is the examination of publications related to a specific topic (Bandara et al., 2015). The literature review aims to select and analyze literature to develop ideas on the nature of a research topic. Literature reviews guide future research by, for example, highlighting relevant research gaps (Webster and Watson, 2002; Rowe, 2014; Müller-Bloch and Kranz, 2015). The term systematic literature review (Okoli and Schabram, 2010; Rowe, 2014; S. K. Boell and Cecez-Kecmanovic, 2015) refers to the reproducibility of results by following a structured research method (Müller-Bloch and Kranz, 2015). In this context, rigor in the research process is as essential as that applied in primary research (Müller-Bloch and Kranz, 2015). In this study, we view literature reviews that follow a structured approach as systematic literature reviews and do not differentiate them into subtypes – such as literature review, critical review, integrative review, a meta-analysis (Bandara et al., 2015; Pare, Trudel, Jaana and Kitsiou, 2015) – or depending on the purpose of the review, e.g., grounding research in literature, or being a stand-alone literature review (Okoli and Schabram, 2010). However, we would like to note that not all literature reviews follow the same steps (Templier and Pare, 2015) but can be compared by them. Nonetheless, the goal of this study is to provide a synthesis on the topic of LRM and, therefore, this generalized notion is necessary.

The approach presented by Webster and Watson (2002) is regarded by many as the quasi-standard approach for a systematic literature review in IS research (Wolfswinkel, Furthmueller and Wilderom, 2011; Müller-Bloch and Kranz, 2015). Nonetheless, other articles have been published with different approaches to guide a systematic literature review (e.g., Bandara et al. 2015; Churchill 1979; Levy and Ellis 2006; Wolfswinkel et al. 2011). Each review adds a different perspective to the process, focusing on the activity of searching for literature (Levy and Ellis, 2006; vom Brocke et al., 2009), on coding the articles (Wolfswinkel et al., 2011), or devising adapted approaches demanded by specific characteristics within a research field, e.g., marketing (Churchill, 1979). This allows researchers an opportunity to select from a wide array of different methods, where each method possesses different approaches and foci to conduct a literature review. However, to the best of our knowledge, there is no current comparison of the conventional approaches and no summary of the various steps and elements of each approach. Researchers have to identify which method fits their research individually, leaving room for a mismatched method and research goal.

Research Approach

The goal of this study is to find, analyze, and synthesize literature review practices. Thus, we decided to apply a research process that is structured into three phases. In the first phase, published literature review studies are analyzed to gather an understanding of how literature reviews are carried out. The applied methods are also gathered in this process for analysis in the second phase. In the second phase, the gathered LRMs are also reviewed to add the perspective of established LRMs. Lastly, in the third phase, the results of both reviews are combined to develop a composite LRM, providing a systematic overview of existing options.

Phase 1: Review of Literature Review Method Application

The objective of the first research phase was to gather an overview of literature review applications that would lead to a gathering of applied LRMs and an understanding of how literature review studies apply them. To gather this overview, a systematic and structured literature review approach was applied, following the guidelines of vom Brocke et al. (2009) and Webster and Watson (2002). Firstly, to define the

scope and topic of this review process, we decided to focus on the process of carrying out literature reviews and the literature review guidelines, steps, or elements that are applied. Secondly, in the literature search step, we had to gather literature by defining search and filter criteria. As a first criterion publications must have included a structured literature review. Hence, articles without a literature review or those that only discussed the most important and central pieces of literature (without an extensive literature search) were omitted. As a second criterion, we selected publications only from journals within the basket of eight and the proceedings of the International Conference on Information Systems (ICIS). We decided to select these publication outlets to ensure theoretical and practical rigor, impact, and relevance (Levy and Ellis, 2006). Furthermore, by assessing the number of hits and publications relevant to our study, we shed light on the extent to which literature reviews are carried out with the IS community. We applied the following search term for our literature search:

(“Literature Review*” OR “Literature-Review*” OR “Literaturereview”*)

The literature search was performed in October and November of 2017, and, after subtracting doubles, 2154 publications were gathered in total. Firstly, articles were selected by title, keywords, and abstract. Secondly, the remaining articles were filtered by two independent academic researchers. Each article was reviewed until its relevance for this study and fit for the previously defined criteria became clear. Each decision was discussed until it was agreed upon by both the researchers. In this process, the literature was also pre-classified, depending on the application of a systematic literature review. The results of the literature search are summarized in Table 1.

Outlet	Hits	Not Relevant	No Method Referenced or Presented	Filtered
<i>European Journal of Information Systems</i>	224	171	44	9
<i>Information Systems Journal</i>	133	97	26	10
<i>Information Systems Research</i>	163	127	33	3
<i>Journal of AIS</i>	106	67	33	6
<i>Journal of Information Technology</i>	138	96	31	11
<i>Journal of MIS</i>	244	219	23	2
<i>Journal of Strategic Information Systems</i>	91	65	22	4
<i>MISQ</i>	161	120	31	10
<i>ICIS</i>	894	677	134	83
Σ	2154	1639	377	138

Table 1. Search Results: Literature Review Studies

To analyze and synthesize the literature, we followed the concept matrix approach of Webster and Watson (2002). As the aim of this study is to identify commonly applied methods (RQ1), we had to predefine related concepts and units of analysis that enable the answering of these questions. Regarding RQ1, we elicited a list of referenced methods, containing ten (counting two similar methods as one) different articles on writing a literature review, from the literature sample.

Furthermore, to analyze the level of transparency provided by an article regarding the applied LRM, we added the concept of transparency with the following dimensions: (1) **No Method Referenced:** When an article applied and documented a structured literature review process (regarding steps taken) but did not reference any source for it, it was classified as “No Method Referenced.” (2) **No Method Description:** When an article referenced a source for the applied literature review process but did not document the steps taken, it was classified as “No Method Description.” (3) **Method Referenced and Described:** When an article referenced a source and documented the literature review process, it was classified as “Method Referenced and Described.”

The literature review revealed a clear pattern in IS-related literature reviews (see Table 2). The LRM of Webster and Watson (2002) is the most commonly applied method by far (99 out of 138), whereas the article of vom Brocke et al. (2009) is the second most cited article with 11 references. Furthermore, the approach of vom Brocke et al. (2009) is often combined with the approach of Webster and Watson (2002) (8 out of 11). Two-thirds (91 out of 138) of the analyzed publications provide a reference and description of the applied LRM.

During the review process, it became apparent that the LRM is often primarily applied for the literature search and initial analysis (e.g., in the form of a concept matrix) followed by different approaches for more in-depth analysis and synthesis. This shows that the general idea of structured literature reviews (Webster and Watson, 2002) was followed but adapted and expanded for the particular research context by supplementing it with various literature/data analysis approaches (e.g., taxonomy development, cluster analysis, meta-analysis).

Article	Method											Transparency			
	Bandara et al. (2015)	Boell and Cecez-Kecmanivc (2014)	Churchill (1979)	Fettke (2006)	Kitchenham (2004)	Kitchenham and Charters (2007)	Levy and Ellis (2006)	Okoli and Schabram (2010)	vom Brocke et al. (2009)	Webster and Watson (2002)	Wolfswinkel et al. (2013)	Method Referenced and Described	No Method Referenced	No Method Description	
Abouzahra et al. (2015)										X		X			
...															
Zuchowski et al. (2016)					X	X				X		X			
N 138	Σ	1	3	5	2	2	3	4	6	11	99	2	92	28	18

Table 2. Excerpt of Concept Matrix

Phase 2: Review of Literature Review Methods

The objective of the second research phase was to provide a baseline for future method development in the form of a summary and a comparison of common LRMs identified in the previous phase. Each LRM article was read by two academic researchers and discussed later on. In order to display and compare the different approaches in Table 3, we selected the steps of vom Brocke et al. (2009). Note that any method could have been used for this purpose.

Firstly, the format of the approaches ranges from a three-step format (Sebastian K. Boell and Cecez-Kecmanovic, 2014) to an eight-step format (Levy and Ellis, 2006; Okoli and Schabram, 2010). The different foci of the methods primarily caused this. For example, the approach of Churchill (1979) was developed to enable better measures of marketing constructs and provides a precise eight-step approach to gather and review the literature to develop such measures.

Meta Steps (vom Brocke et al. 2009)	Bandara et al. (2015)	Boell and Cecez-Kecmanovic (2014)	Churchill (1979)	Fettke (2006)	Levy and Ellis (2006)	Kitchenham and Charters (2004, 2007)	Okoli and Schabram (2010)	Webster and Watson (2002)	Wolfswinkel et al. (2013)
1. Definition of Review Scope	1. Identification of Relevant Literature	1. Initial Ideas	1. Specify Domain of Construct 2. Generate Sample of Items	1. Problem Formulation	1. Input	1. Planning the Review	1. Identify Purpose 2. Protocol and Training	1. Define Topic 2. Set Boundaries	1. Define Scope
2. Conceptualization of Topic		2. Search and Acquisition	3. Collect Data 4. Purify Measure 5. Collect Data	2. Literature Search	2. Know Literature 3. Comprehend Literature 4. Apply	2. Identification 3. Selection 4. Assessment 5. Extraction	3. Search Literature 4. Screen	3. Search Literature 4. Backward and Forward Search	2. Search Literature 3. Refine Sample
3. Literature Search	2. Organization of Analysis 3. Coding and Analysis	3. Analysis and Interpretation	6. Assess Reliability 7. Assess Validity	3. Literature Analysis 4. Interpretation	5. Analyse 6. Synthesize 7. Evaluate	6. Synthesis	5. Quality Appraisal 6. Data Extraction 7. Synthesis	5. Theory Development 6. Theory Evaluation 7. Discussion	4. Open Coding 5. Axial Coding 6. Selective Coding
4. Literature Analysis and Synthesis	4. Write-up and Presentation		8. Develop Norms	5. Presentation	8. Output	7. Report	8. Write Review		7. Present
5. Research Agenda									

Table 3. Literature Review Method Comparison

Secondly, the provided details for each step also differ vastly between methods. Some offer a very high level of abstraction (vom Brocke et al., 2009; Sebastian K. Boell and Cecez-Kecmanovic, 2014), describing the necessary mindset for a successful literature review, enriched by some examples (Webster and Watson,

2002). In contrast, some articles are very detailed (Churchill, 1979; Levy and Ellis, 2006; Wolfswinkel et al., 2011), for example, providing details on databases and publication outlet quality (Levy and Ellis, 2006). Additionally, the methods display an emphasis on different parts of a literature review. Some are more concerned with the literature search process (Bandara et al., 2015) while others are more focused on the effective way of summarizing and displaying the results of the analysis (Webster and Watson, 2002; Wolfswinkel et al., 2011).

Ultimately, the gathered LRMs reflect the diversity of IS research, ranging from behavior- over management to design-oriented research, addressing topics on different levels, e.g., individual, organization, and society (Banker and Kauffman, 2004). Each research topic brings its own set of challenges when reviewing literature and demanding for tailored approaches. Despite that, researchers tend to opt for a more general approach (e.g., Webster and Watson 2002).

Phase 3: Development of a Literature Review Method

As the reviews in the previous two phases revealed, LRMs are used as a frame of reference to select and assemble various LRM elements. However, many different practices can be observed that do not fit within the existing LRM or are not directly described by them. To facilitate a better understanding of how a systematic literature review can be conducted, the gathered knowledge from the two previous phases is brought together in the form of a LRM. For the development of this composite LRM, we adapted the concept of method engineering (Brinkkemper, 1996), deconstructing the found approaches into method elements, which are then selected and re-assembled to form a comprehensive LRM (see Figure 1). To evaluate the development of the LRM, we had periodical meetings with other academic researchers to present the LRM and gather feedback. The feedback was incorporated in the form of new literature review elements and also during the selection and assembly process.

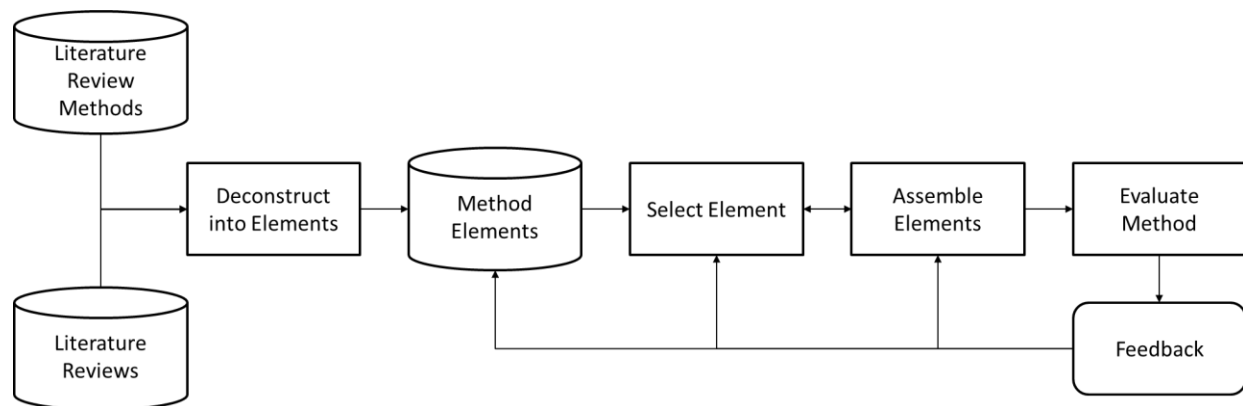


Figure 1. Applied Method Development Process (Based on Brinkkemper (1996))

The developed LRM adapts the steps of vom Brocke et al. (2009) but splits analysis and synthesis into two steps. Therefore, the developed LRM has six steps: Preparation, Define Scope, Literature Search, Analysis, Synthesis, and Discussion (see Figure 2). Also, the developed method is built around iterations (similar to Churchill 1979; Wolfswinkel et al. 2011), providing the possibility to traverse back to a previous step in certain situations.

Step 1: Preparation

The goal of the literature review has to be defined in this step. The goal of a literature review can range from literature synthesis and summary over-identifying commonly applied methods/theories on spotting research gaps (Webster and Watson, 2002; vom Brocke et al., 2009). Secondly, the research area has to be defined (vom Brocke et al., 2009), for example, in terms of a research stream (Banker and Kauffman, 2004). This will later help define the type of publications to be included in the literature review. This step also includes the formulation of research questions (Kitchenham and Charters, 2007) to formalize the research goal.

Step 2: Define Scope

The researcher must define the types of publications relevant to the literature review in the second step. This demands the conceptualization of the necessary qualifications a publication must possess to fit the research goal as well as the research field of interest (vom Brocke et al., 2009). In this step, reading other literature reviews can be beneficial (Kitchenham and Charters, 2007) as they indicate the appropriate construction of search queries and provide an overview of information already covered by other literature reviews. Next, the researcher has to identify terms relevant to the literature review and formulate a search query (Levy and Ellis, 2006). Additionally, appropriate publication outlets and databases have to be identified. In this step, it is important to consider the set goal of the research process, indicating whether only specific disciplines (e.g., IS, Management Science, Computer Science) should be included in the literature review and also the type of outlets that relate to the interest area, e.g., conferences and/or journals (conferences provide the latest publications but are less refined when compared to journals), high-ranking and/or low-ranking (lesser-known research topics may not be present in high-ranking journals) (Levy and Ellis, 2006), and scientific/peer-reviewed, or non-scientific. For this, iterating between query formulation and pre-testing (Sebastian K. Boell and Cecez-Kecmanovic, 2014) can help formulate the best fitting query and identify the best outlets/databases for the following step.

Step 3: Literature Search

In the literature search step, the previously identified outlets and databases are searched for publications. As an initial step, looking at publications included in previous literature review studies can provide the first set of publications. Similarly, analyzing the list of reference of pivotal articles can give a first indication of appropriate literature, outlets and keywords (Larsen, Hovorka, Dennis and West, 2019). Subsequently, it is important to decide on the type of search to be carried out in publication databases: title and/or abstract or full-text search (Levy and Ellis, 2006). A full-text search is not always supported by databases and might also lead to fuzzy results, including many articles irrelevant for the literature review. However, a search only considering the title and/or abstract is prone to filtering out articles that could potentially be relevant for the literature search. After searching for the initial set of publications, a filtering process must be applied. In this step, the previously defined goal and scope of the literature review guide the reviewer in filtering out publications irrelevant to the literature review, including the omission of doubles (Braccini and Federici, 2013). In this context, when working in a team, a review protocol should be developed, and the reviewers should be trained to secure coherent judgments (Okoli and Schabram, 2010). Also, the configuration of the cooperation during the literature review has to be defined (e.g., pair reviewing, double reviewing) to address the problem of subjectivity (e.g., individual biases). After this step, the researcher must decide whether the literature corpus is big enough to make substantial and coherent statements about the reviewed research field or whether the literature corpus is too big, for example, making it impossible to understand the literature coherently. For this, the researcher has to decide whether the goal is to find all literature, a representative or selective sample, or only the most important publications (Levy and Ellis, 2006). Nonetheless, in the case of an insufficient amount of literature, a forward and backward search (Webster and Watson, 2002; Walsh et al., 2015) can help extend the set of found literature. When the literature sample remains too small, the next option is to jump back to step two, to revisit the search query and outlets/databases, or to step one, redefining the review topic. In the case of too much literature, limiting the time frame can help filter out relevant but no longer up-to-date publications, for example, limiting the time frame to the last ten years (Leukel, Mueller and Sugumaran, 2014).

Step 4: Analysis

Firstly, the filtered set of publications must be coded (Wolfswinkel et al., 2011; Bandara et al., 2015). For this, relevant concepts and related dimensions/characteristics have to be identified by applying established theories or models (Arnott and Pervan, 2012; Yun, Lee and Kim, 2014) or by inductively gathering them from the content of the publications (Wolfswinkel et al., 2011). Hence, the dimensions can be identified ex-ante, or during the coding process, for example, the review process can iterate between identifying concepts and coding the literature. Similar to the literature filtering process, developing and applying a comprehensive coding guideline can help teams make consistent coding decisions (Arnott and Pervan, 2012). Subsequently, each publication has to be analyzed by dimension/concept. The coded literature can then be comprehensively summarized to provide a certain abstraction; for example, the first step is

commonly the construction of a concept matrix (Webster and Watson, 2002). For further analysis, methods such as cluster analysis (Remane et al., 2016), time series analysis (Leukel et al., 2014), taxonomy development (Hummel, Schacht and Maedche, 2016), or meta-analysis (Yun et al., 2014) are feasible. Each of these approaches offers different insights into a research field and should be chosen and combined accordingly. For example, cluster analysis can help to find patterns in coded articles that a concept matrix might not reveal, such as which characteristics appear together. This is especially beneficial in the context of large literature samples. Similarly, a citation-network-analysis can help to understand better which articles are related to each other, helping to make statements about relations or research streams (Dobrkovic, Döppner, Iacob and van Hillegersberg, 2018).

Step 5: Synthesis

Building upon the results of the analysis, the next step aims to interoperate and synthesize the results to provide a deeper understanding of the reviewed research field. The previous step provides the descriptive base for inductive theorizing. Different results are possible in this step, such as model-based syntheses, such as theory, research framework (Schlagwein and Hu, 2017), or taxonomy (Hummel et al., 2016). Complementary directions for future research (Arnott and Pervan, 2012; Hassan and Loebbecke, 2017), a list of important research gaps (Okoli and Schabram, 2010), or a summary and interpretation of commonly applied methods (Hassan and Loebbecke, 2017) or theories can be formulated. In this context, research should avoid being overly critical with previous research (Webster and Watson, 2002) or falling victim to assuming that because something is missing in current research, it has to be a research gap (Müller-Bloch and Kranz, 2015). Sometimes, there are other explanations for a gap. Hence, research should apply the required caution while interpreting the analysis results. In this context, it can be necessary to go back to the analysis step, searching for further evidence to make stronger claims. Making strong claims should be the goal, but hastily making them can lead to a weak literature review.

Step 6: Discussion

Lastly, the developed synthesis of the review results should be discussed and set into the context of the greater scientific discourse. This can be done by demonstrating how the results fit in the context of current research and how they expand our current understanding of the review topics. Directions on how to investigate the results empirically are also worth discussing. Most importantly, the implications for practice and future research should be drawn (Webster and Watson, 2002). Additionally, the limitations of the literature review process should be discussed to set its contributions in perspective (Whetten, 1989; Kleinschmidt, Peters and Leimeister, 2016). Thus, the discussion extends the synthesis step by “taking a step back” and evaluating the results in the greater context of the IS discourse.

Discussion and Conclusion

To understand the current status quo of structure literature review application, we conducted a comprehensive literature review of literature review practices in the IS community. The first question aimed at developing an overview of available LRMs and was answered by analyzing literature review studies regarding their applied methodology. Ten methods were found, revealing the method of Webster and Watson (2002) to be the most often applied method by far. Nonetheless, during the review process, the richness of approaches was surprising, and deviations and additions to established approaches were found, providing fertile ground for method development. The second research question aims to transform the gathered detailed knowledge of literature review practices into prescriptive knowledge. For this, a composite LRM was developed based on the elements present in methods and literature review articles. The resulting LRM provides a summary of how IS scholars are conducting literature reviews. Thus, the developed method provides a guideline on how to conduct a literature review based on current practices. Specially, we see the developed LRM as a baseline approach for early career academics, starting their academic career. Either by following the composite LRM or reading into the referred to studies and LRM articles, a researcher can systematically investigate the richness and versatility of ways a LRM can be conducted.

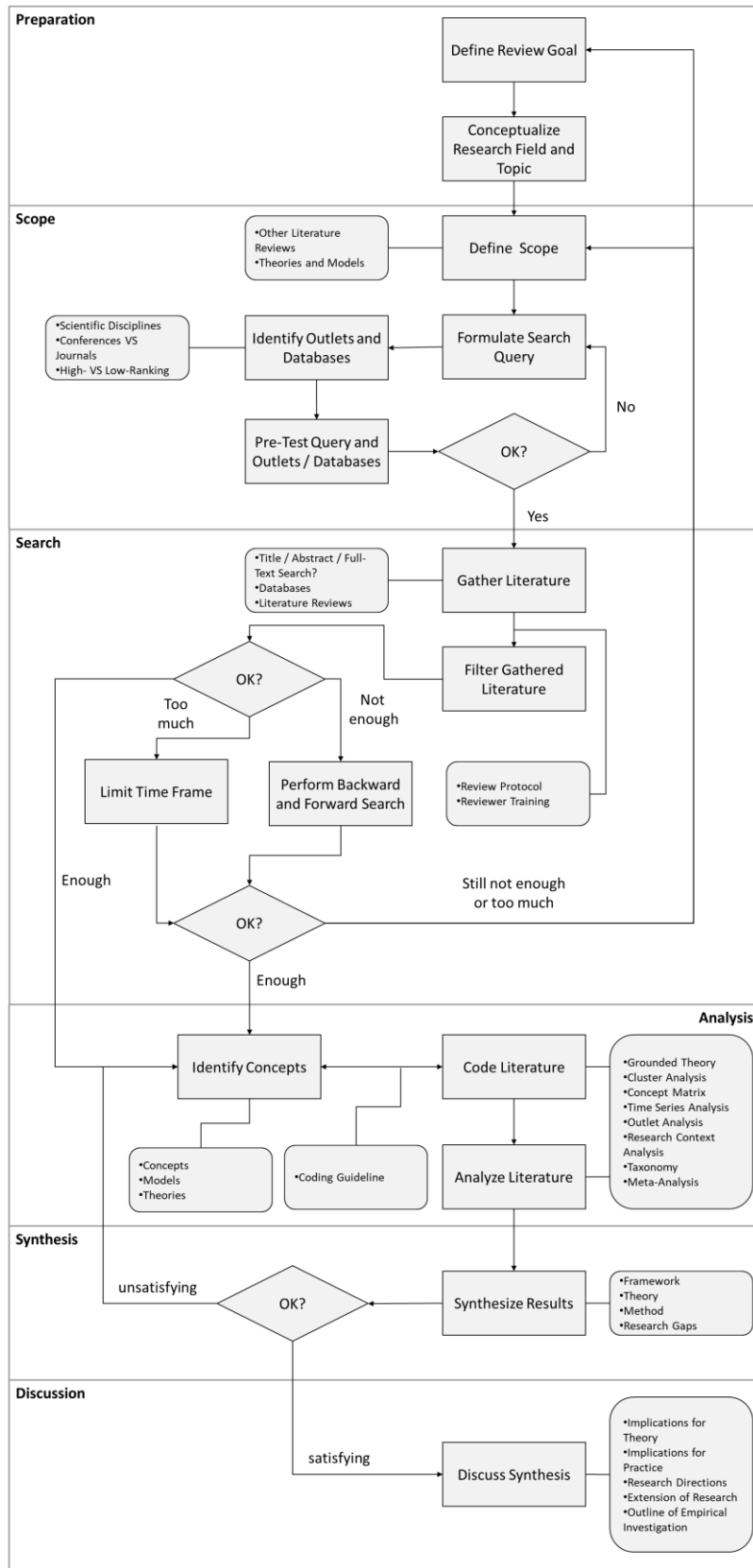


Figure 2. Composite Literature Review Method

In the following, we will outline the limitations and opportunities for future research. Firstly, in this article, we only considered IS publications and only from a selection of outlets. Hence, future research might benefit from adding elements from other outlets and disciplines (Schryen et al., 2017). Secondly, the method construction process is impacted by subjectivity. For instance, even though several feedback meetings with other researchers were carried out, subjectivity remains an issue, such as how feedback is understood and implemented. Hence, the merit and value of the developed method will only become evident during its application. Thirdly, given that tool support for literature review is an upcoming topic of research (Bandara et al., 2015; Sturm and Sunyaev, 2017), applying new data processing methods, such as natural language processing or topic modeling, promises excellent advantages. Therefore, future research should engage in supporting a modular literature review process (similar to the presented one) by designing tool support for the individual steps and applied methods. Lastly, we saw a great variety in applied data analysis methods, each providing specific deeper insights into the reviewed topic. Hence, future research should engage in systematically investigating, which analysis methods are applicable, and what insights each of them can provide.

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